Final
Site-Specific Field Sampling Plan, Site-Specific Safety and Health Plan, and Site-Specific Unexploded Ordnance Safety Plan Attachments Former Mock Village at Yahoo Lake, Parcel 130Q-X

Fort McClellan
Calhoun County, Alabama

Task Order CK10
Contract No. DACA21-96-D-0018
IT Project No. 796887

September 2000

Revision 1

Final
Site-Specific Field Sampling Plan Attachment
Site Investigation at Former Mock Village at Yahoo Lake, Parcel 130Q-X

Fort McClellan
Calhoun County, Alabama

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Executive Summary

In accordance with Contract Number DACA21-96-D-0018, Task Order CK10, IT Corporation (IT) will conduct site investigation activities at the Former Mock Village at Yahoo Lake, Parcel 130Q-X, at Fort McClellan, Calhoun County, Alabama, to determine the presence or absence of potential site-specific chemicals at this site. The purpose of this site-specific field sampling plan (SFSP) is to provide technical guidance for sampling activities at the Former Mock Village at Yahoo Lake, Parcel 130Q-X.

The Former Mock Village at Yahoo Lake, Parcel 130Q-X, is located in the southwest area of the Main Post. The Former Mock Village is located east of Iron Mountain Road, at Yahoo Lake, on the southern slope of Baltzell Hills. Historical maps and aerial photographs indicate that the Former Mock Village at Yahoo Lake was constructed between 1946 and 1954. The Environmental Photographic Interpretation Center Report indicates that the training facility had been abandoned by 1961, and that only building foundations remained at that time. The Former Mock Village at Yahoo Lake, Parcel 130Q-X comprised 5.2 acres and is inactive. Between 1961 and 1969, Remount Creek west of the Former Mock Village was dammed to form Yahoo Lake. Yahoo Lake presently covers the majority of Parcel 130Q-X, although 1.73 acres on the eastern end of the parcel remain above the lake surface. The size of Yahoo Lake is approximately 13.5 acres. The area around Yahoo Lake was then used as a picnic and camping area, but has since been abandoned. However, a view of a 1954 aerial photograph appears to show the Former Mock Village was located further south along both sides of the east-west road where the picnic shelters are now located. This suspected location is just outside the southeast corner of Parcel 130Q-X.

Specific information on utilization of the Former Mock Village facility is unavailable, although it is assumed that training was similar to that which occurred at the Former Mock Vietnam Village. Therefore, the materials used at this training facility are assumed to include chloracetophenone and ortho-chlorobenzylidene-malononitrile tear gas, booby trap devices, flares, and practice smoke grenades.

Specifically, IT will collect five surface soil samples, five subsurface soil samples, five groundwater samples, six surface water samples, and six sediment samples at this site. Potential contaminant sources at the Former Mock Village at Yahoo Lake, Parcel 130Q-X, are primarily unknown, but may include nitroexplosives, chloracetophenone and ortho-chlorobenzylidene-

malononitrile tear gas, flares, and practice smoke grenades. Chemical analyses of the samples collected during the field program will include volatile organic compounds, semivolatile organic compounds, nitroexplosives, and metals. In addition, sediment samples will be analyzed for total organic carbon and grain size. Results from these analyses will be compared with site-specific screening levels and ecological screening values presented in the IT July 2000 *Final Human Health and Ecological Screening Values and PAH Background Summary Report,* and regulatory agency guidelines.

The Former Mock Village at Yahoo Lake, Parcel 130Q-X, falls within the "Possible Explosive Ordnance Impact Areas" shown on Plate 10 of the U.S. Army Corps of Engineers July 1999 *Archives Search Report, Maps, Fort McClellan, Anniston, Alabama;* therefore, unexploded ordnance (UXO) surface sweeps and downhole surveys of soil borings will be required to support field activities at Former Mock Village at Yahoo Lake, Parcel 130Q-X. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purposes of UXO avoidance.

This SFSP attachment to the installation-wide sampling and analysis plan (SAP) for the Former Mock Village at Yahoo Lake, Parcel 130Q-X, will be used in conjunction with the site-specific safety and health plan, the site specific UXO safety plan, the installation-wide work plan, and the SAP. The SAP includes the installation-wide safety and health plan, waste management plan, ordnance and explosives management plan, and quality assurance plan. Site-specific hazard analyses are included in the site-specific safety and health plan and the site-specific UXO safety plan.

1.0 Project Description

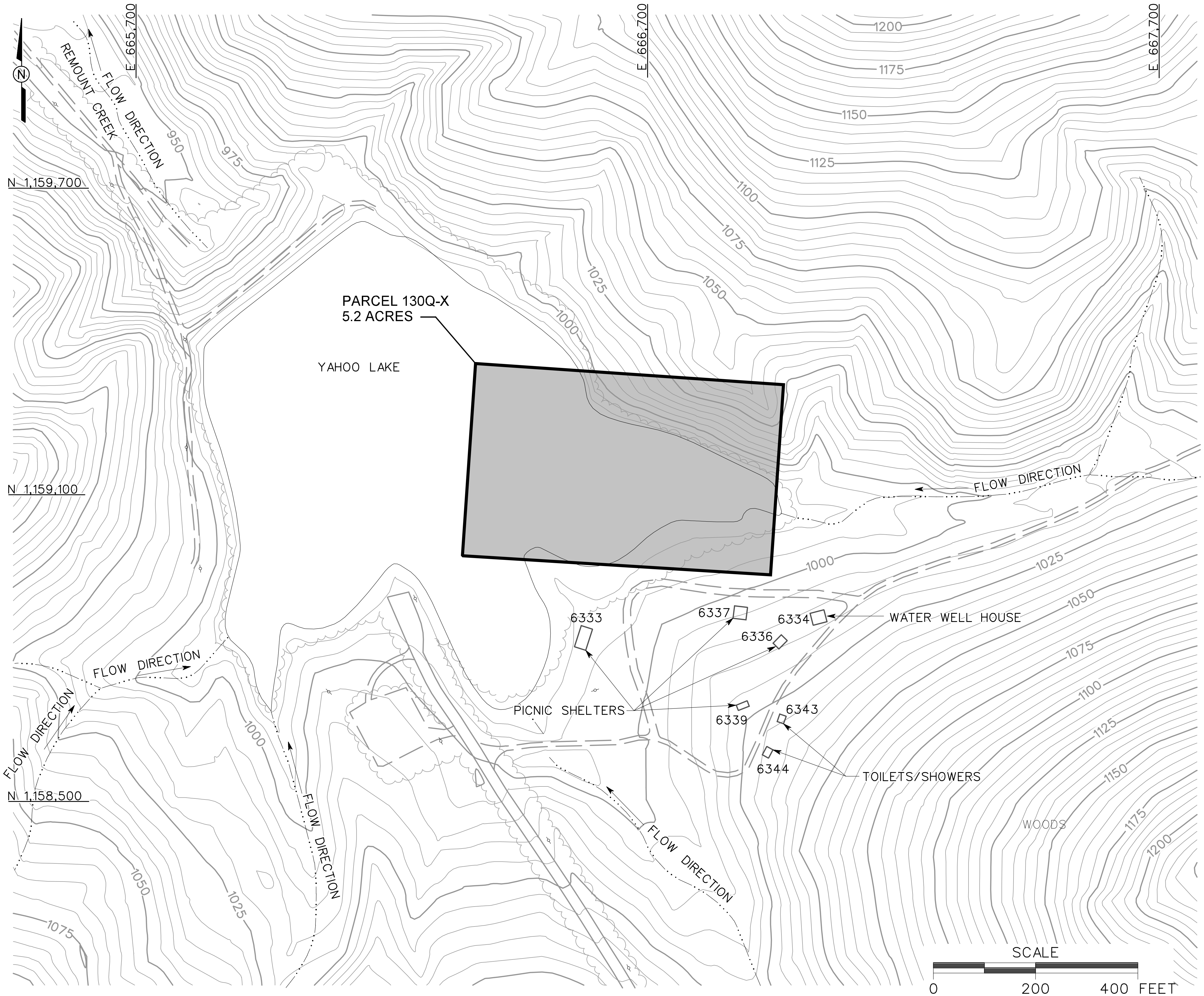
1.1 Introduction

The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of the Former Mock Village at Yahoo Lake, Parcel 130Q-X, under Task Order CK10, Contract Number DACA21-96-D-0018.

This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT, 2000a) for FTMC has been prepared to provide technical guidance for sample collection and analysis at the Former Mock Village at Yahoo Lake, Parcel 130Q-X. This SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) and the site-specific unexploded ordnance (UXO) safety plan developed for the Former Mock Village at Yahoo Lake, Parcel 130Q-X, and the installation-wide work plan (WP) (IT, 1998) and SAP. The SAP includes the installation-wide safety and health plan (SHP), waste management plan, ordnance and explosives management plan, and quality assurance plan (QAP). Site-specific hazard analyses are included in the SSHP and the site-specific UXO safety plan.

1.2 Site Description

The Former Mock Village at Yahoo Lake, Parcel 130Q-X, is located in the southwest area of the Main Post (Figure 1-1). The Former Mock Village is located east of Iron Mountain Road, at Yahoo Lake, on the southern slope of Baltzell Hills (Figure 1-2). Historical maps and aerial photographs indicate that the Former Mock Village at Yahoo Lake was constructed between 1946 and 1954 (Environmental Science and Engineering, Inc. [ESE], 1998). The Environmental Photographic Interpretation Center Report indicates that the training facility had been abandoned by 1961, and that only building foundations remained at that time (ESE, 1998). The Former Mock Village at Yahoo Lake, Parcel 130Q-X comprised 5.2 acres and is inactive. Between 1961 and 1969, Remount Creek west of the Former Mock Village was dammed to form Yahoo Lake (USACE, 1999a). Yahoo Lake presently covers the majority of Parcel 130Q-X, although 1.73 acres on the eastern end of the parcel remain above the lake surface. The size of Yahoo Lake is approximately 13.5 acres (Roy F. Weston Inc., 1990). The area around Yahoo Lake was previously used as a picnic and camping area, but has since been abandoned. However, a review of a 1954 aerial photograph appears to show the Former Mock Village was located further south



LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FOOT)
- TREES / TREELINE
- PARCEL BOUNDARY
- SURFACE DRAINAGE / CREEK
- UTILITY POLE

FIGURE 1-2
SITE MAP
FORMER MOCK VILLAGE AT
YAHOO LAKE
PARCEL 130Q-X

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

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along both sides of the east-west road where the picnic shelters are now located. This suspected location is just outside the southeast corner of Parcel 130Q-X.

Specific information on utilization of the Former Mock Village facility is unavailable, although it is assumed that training was similar to that which occurred at the Former Mock Vietnam Village (ESE, 1998). Therefore, the materials used at this training facility are assumed to include chloroacetophenone and ortho-chlorobenzlidene-malononitrile tear gas, booby trap devices, flares, and practice smoke grenades.

The elevation of the site varies between 990 and 1,035 feet (National Geodetic Vertical Datum of 1929). Surface water in the immediate area appears to drain toward Yahoo Lake. Local shallow groundwater direction at the site is probably controlled by topography; therefore, groundwater direction in the residuum is likely to the west, toward Yahoo Lake.

Soils at the Former Mock Village at Yahoo Lake, Parcel 130Q-X, consist of the Anniston and Allen Series. The Anniston and Allen Series of soils consist of strongly acidic, deep, well-drained soils that have developed in old local alluvium. The parent material washed from the adjacent higher-lying Linker, Muskingum, Enders, and Montevallo soils, which developed from weathered sandstone, shale, and quartzite. Sandstone and quartzite gravel, cobbles, and fragments as much as 8 inches in diameter are on the surface and throughout the soil.

Soils at this site fall into the Anniston and Allen stony loams, 0 to 10 percent slopes, (U.S. Department of Agriculture, 1961). Strong slopes, reduced erosion, and numerous stones, as much as 8 inches in diameter, distinguish the series from the Anniston and Allen gravelly loams, 2 to 6 percent slopes, eroded. The Anniston and Allen stony loams have less erosion, a thicker surface layer, and more stones. The surface soil of this series is very dark brown to dark greyish-brown stony loam, typically 6 to 10 inches thick. At a depth of about 10 inches, this material grades into a dark-red or dark reddish-brown, stony fine sandy loam. Stones and strong slopes make this soil type poorly suited to cultivation, and most of the acreage of this soil type is wooded. This mapping unit consists of friable soils that have developed in old alluvium on foot slopes and along the base of mountains. This soil type is permeable, has medium infiltration, and a high capacity for available moisture.

1.3 Scope of Work

The scope of work for activities associated with the SI at the Former Mock Village at Yahoo Lake, Parcel 130Q-X, as specified by the statement of work (USACE, 1999b), includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Conduct a surface and near-surface UXO survey over all areas to be included in the supplemental sampling effort.
- Provide downhole UXO support for all intrusive drilling to determine buried downhole hazards.
- Collect five surface soil samples, five subsurface soil samples, five groundwater samples, six surface water samples, and six sediment samples to determine whether potential site-specific chemicals (PSSC) are present at the Former Mock Village at Yahoo Lake, Parcel 130Q-X site and to provide data useful for supporting any future planned corrective measures and closure activities.
- Samples will be analyzed for the parameters listed in Section 4.5.

The Former Mock Village at Yahoo Lake, Parcel 130Q-X, falls within the "Possible Explosive Ordnance Impact Areas" shown on Plate 10 of the *Archives Search Report, Maps, Fort McClellan, Anniston, Alabama* (USACE, 1999a); therefore, UXO surface sweeps and downhole surveys of soil borings will be required to support field activities at this site. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purposes of UXO avoidance. The site-specific UXO safety plan will be used to support hazardous, toxic, and radiological waste investigation and construction activities at the Former Mock Village at Yahoo Lake should incidental ordnance, explosive, and UXO be encountered and require avoidance or disposal.

At completion of the field activities and sample analyses, draft and final SI summary reports will be prepared to summarize the results of the activities, to evaluate the absence or presence of PSSCs at this site, and to recommend further actions, if appropriate. SI sampling reports will be prepared in accordance with current U.S. Environmental Protection Agency (EPA), Region IV and the Alabama Department of Environmental Management (ADEM) guidelines.

2.0 Summary of Existing Environmental Studies

An environmental baseline survey (EBS) was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by the following seven criteria:

1. Areas where no storage, release, or disposal (including migration) has occurred
2. Areas where only release or disposal of petroleum products has occurred
3. Areas of contamination below action levels
4. Areas where all necessary remedial actions have been taken
5. Areas of known contamination with removal and/or remedial action underway
6. Areas of known contamination where required response actions have not been taken
7. Areas that are not evaluated or require further evaluation.

For non-Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) environmental or safety issues, the parcel label includes the following components: a unique non-CERCLA issue number, the letter "Q" designating the parcel as a Community Environmental Response Facilitation Act (CERFA) Category 1 Qualified Parcel, and the code for the specific non-CERCLA issue(s) present (ESE, 1998). The non-CERCLA issue codes used are:

- A = Asbestos (in buildings)
- L = Lead-based paint (in buildings)
- P = Polychlorinated biphenyls
- R = Radon (in buildings)
- RD = Radionuclides/radiological issues
- X = UXO
- CWM = Chemical warfare material.

The EBS was conducted in accordance with the CERFA (CERFA-Public Law 102-426) protocols and U.S. Department of Defense policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, ADEM, EPA Region IV, and Calhoun County, as well as a database search of CERCLA-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

The Former Mock Village at Yahoo Lake, Parcel 130Q-X, was identified as a Category 1 CERFA site, qualified "X" for UXO. This CERFA site is a parcel where no known or recorded storage, release, or disposal (including migration) has occurred on site property, but is qualified for potential UXO. The Former Mock Village at Yahoo Lake, Parcel 130Q-X also requires additional evaluation to determine the environmental condition of the parcel.

3.0 Site-Specific Data Quality Objectives

3.1 Overview

The data quality objective (DQO) process is followed to establish data requirements. This process ensures that the proper quantity and quality of data are generated to support the decision-making process associated with the action selection for the Former Mock Village at Yahoo Lake, Parcel 130Q-X. This section incorporates the components of the DQO process described in the publication EPA 540-R-93-071 *Data Quality Objectives Process for Superfund* (EPA, 1993). The DQO process as applied to the Former Mock Village at Yahoo Lake, Parcel 130Q-X site is described in more detail in Section 4.3 of the WP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples, and the procedures necessary to meet the objectives of the SI and establish a basis for future action at this site.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

3.2 Data Users and Available Data

The available data, presented in Table 3-1, related to the SI at the Former Mock Village, Parcel 130Q-X site have been used to formulate a site-specific conceptual model. This conceptual model was developed to support the development of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The data users for the data and information generated during field activities are primarily EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide the level of defensible data and information required to confirm or rule out the existence of residual chemical contamination in site media.

Table 3-1

Summary of Data Quality Objectives
Former Mock Village at Yahoo Lake, Parcel 130Q-X
Site Investigation
Fort McClellan, Calhoun County, Alabama

Users	Available Data	Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA, ADEM USACE, DOD FTMC, IT Corporation Other contractors, and possible future land users	None	Contaminant Source Former Mock Village at Yahoo Lake Parcel 130Q-X Migration Pathways Infiltration to subsurface soil, infiltration and leaching to groundwater, biotransfer to fish and venison, dust emissions and volatilization to ambient air, and runoff and erosion to surface water and sediment Potential Receptors Residents (future), construction workers (future), Groundskeepers (current and future) Recreational site user (future), PSSC metals and explosives	Surface soil Subsurface Soil Groundwater Surface Water Sediment	SI to confirm the presence or absence of contamination in the site media Definitive quality data for future decision-making	Surface soil TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives	Definitive data in CESAS Level B data packages	5 direct-push soil samples + QC
					Subsurface Soil TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives	Definitive data in CESAS Level B data packages	5 direct-push soil samples + QC
					Groundwater TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives	Definitive data in CESAS Level B data packages	5 groundwater samples + QC
					Surface Water TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives	Definitive data in CESAS Level B data packages	6 surface water samples + QC
					Sediment TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, TOC, and Grain Size	Definitive data in CESAS Level B data packages	6 sediment samples + QC

ADEM - Alabama Department of Environmental Management.
CESAS - Corps of Engineers South Atlantic Savannah.
DOD - U.S. Department of Defense.
EPA - U.S. Environmental Protection Agency.
FTMC - Fort McClellan.
USACE - U.S. Army Corps of Engineers.
SI - Site investigation.
QC - Quality control.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.
TCL - Target compound list.
TAL - Target analyte list.
TOC - Total organic carbon.
PSSC - Potential site-specific chemical.

3.3 Conceptual Site Exposure Model

The conceptual site exposure model (CSEM) provides the basis for identifying and evaluating potential risks and hazards to human health in the risk assessment. The CSEM includes receptors and potential exposure pathways appropriate to all plausible scenarios. The CSEM facilitates a consistent and comprehensive evaluation of risk to human health through graphically presenting all possible exposure pathways, including sources, release and transport pathways, and exposure routes. In addition, the CSEM helps to ensure that potential pathways are not overlooked. The elements of a complete exposure pathway and CSEM are:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not relevant for direct receptor contact scenarios with a contaminated source medium.

Primary contaminant releases were probably limited to leaks and spills that entered surface soil. Potential contaminant transport pathways include infiltration and leaching to subsurface soil and groundwater, biotransfer to fish and deer, dust emissions and volatilization to ambient air, groundwater to surface water, surface water runoff, and erosion to surface water and sediment.

Currently the site is not utilized, and is not maintained. The site is not fenced, and therefore people may trespass at the site for hunting or fishing. Most of the site is under water and alongside Yahoo Lake. The only plausible receptors under these current land-use scenarios are a recreational site user who may fish or hunt. Other potential receptors considered, but not included under current land-use scenarios, are the:

- ***Construction Worker.*** The site is unused, and no development or construction is occurring or scheduled.
- ***Resident.*** The site is not currently used for residential purposes.

Future land-use in this area is shown as Remediation Reserve (FTMC, 1997) and will likely be used for a religious or corporate retreat. The site may not be deemed safe for public access until remediation has been completed because of the potential for UXO (FTMC, 1997). Plausible future land-use receptor scenarios addressed in the CSEM include:

- ***Resident.*** The site is expected to be used as a retreat with residences in the future; however, since most people will only be visiting the site while on retreat, the residential scenario is considered in order to provide information for the Project Manager and regulators. The retreat may not represent a true residential scenario since the exposure duration and frequency would be much less at a retreat than at a true residence.

- ***Groundskeeper.*** The site is likely to have areas that will need to be maintained, such as around buildings and parking lots.

- ***Construction Worker.*** It is anticipated that some construction will occur at the site in the future, thus this receptor is evaluated.

- ***Recreational Site User.*** The site is planned for recreational use. Hunting and fishing are potential exposure pathways for the recreational site user.

A summary of relevant contaminant release and transport mechanisms, source and exposure media, and receptors and exposure pathways for this site is provided in Table 3-1 and Figure 3-1.

3.4 Decision-Making Process, Data Uses, and Needs

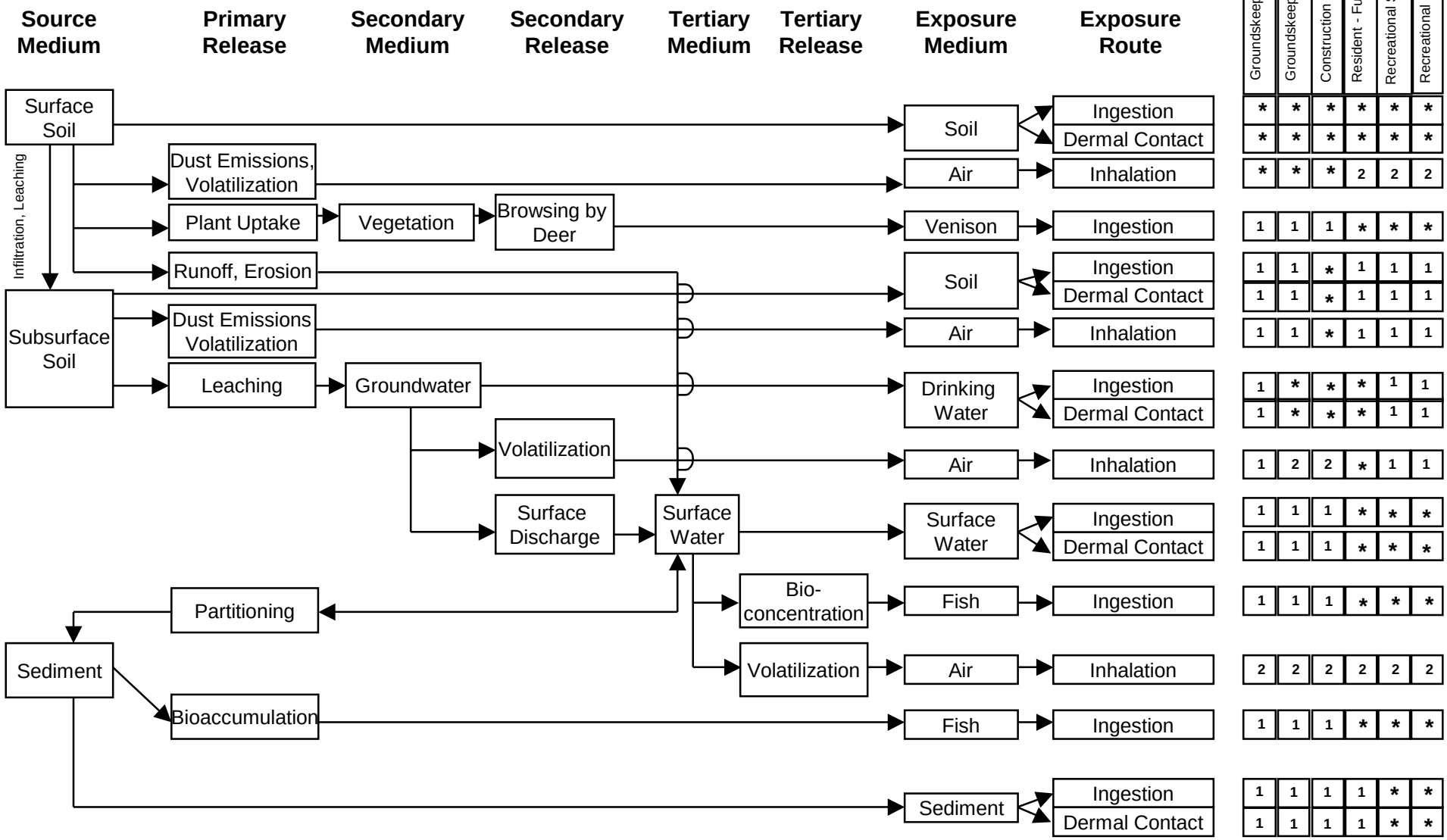
The decision-making process consists of a seven-step process that is presented in detail in Section 4.3 of the WP and will be followed during the SI at the Former Mock Village at Yahoo Lake, Parcel 130Q-X. Data uses and needs are summarized in Table 3-1.

3.4.1 Risk Evaluation

Confirmation of contamination at the Former Mock Village at Yahoo Lake, Parcel 130Q-X, will be based on comparing detected site chemicals of potential concern to site-specific screening levels developed in the *Final Human Health and Ecological Screening Values and PAH Background Summary Report* (IT, 2000b). EPA definitive data with CESAS Level B data packages will be used to determine whether or not PSSCs are detected in site media. Definitive data will be adequate for confirming the presence of site contamination and for supporting a feasibility study and risk assessment.

Assessment of potential ecological risk associated with sites or parcels (e.g., surface water and sediment sampling, specific ecological assessment methods, etc.) will be addressed in accordance with the procedures in the WP.

Figure 3-1
Human Health Conceptual Site Exposure Model
Former Mock Village at Yahoo Lake, Parcel 130Q-X
Fort McClellan, Calhoun County, Alabama



* = Complete exposure pathway evaluated in the streamlined risk assessment.
1 = Incomplete exposure pathway.
2 = Although theoretically complete, this pathway is judged to be insignificant and is not evaluated in the streamlined risk assessment.

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3.4.2 Data Types and Quality

Surface soil, subsurface soil, groundwater, surface water, and sediment samples will be sampled and analyzed to meet the objectives of the SI at the Former Mock Village at Yahoo Lake, Parcel 130Q-X. Quality assurance/quality control (QA/QC) samples will be collected for all sample types as described in Chapter 4.0 of this SFSP. Samples will be analyzed by EPA-approved SW-846 Methods Update III, where available; comply with EPA definitive data requirements; and be reported using hard copy data packages. In addition to meeting the quality needs of this SI, data analyzed at this level of quality are appropriate for all phases of site characterization, remedial investigation, and risk assessment.

3.4.3 Precision, Accuracy, and Completeness

Laboratory requirements of precision, accuracy, and completeness for this SI are provided in Section 9.0 of the QAP.

4.0 Field Activities

4.1 UXO Survey Requirements and Utility Clearances

The Former Mock Village at Yahoo Lake, Parcel 130Q-X falls within the "Possible Explosive Ordnance Impact Area" shown on Plate 10 of the *Archives Search Report, Maps, Fort McClellan, Anniston, Alabama* (USACE, 1999a). Therefore, IT will conduct UXO avoidance activities, including surface sweeps and downhole surveys of soil borings.

4.1.1 Surface UXO Survey

A UXO sweep will be conducted over areas that will be included in the sampling and surveying activities to identify UXO on or near the surface that may present a hazard to on-site workers during field activities. Low-sensitivity magnetometers will be used to locate surface and shallow-buried metal objects. UXO located on the surface will be identified and conspicuously marked for each avoidance. Subsurface metallic anomalies will not be disturbed, and will also be marked for easy avoidance. UXO personnel requirements, procedures, and detailed descriptions of the geophysical equipment to be used are provided in Chapter 4.0 and Appendices D and E of the approved SAP (IT, 2000a).

4.1.2 Downhole UXO Survey

During the soil boring and downhole sampling, downhole UXO surveys will be performed to determine if buried metallic objects are present. UXO monitoring, as described in Chapter 4.0 of the SAP (IT, 2000a), will continue until undisturbed soils are encountered or the borehole has been advanced to 12 feet below ground surface, whichever is reached first.

4.1.3 Utility Clearances

After the UXO surface survey has cleared the area to be sampled and prior to performing any intrusive sampling, a utility clearance will be performed at locations where soil and groundwater samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP (IT, 2000a). The site manager will mark the proposed locations with stakes, coordinate with the local utility companies to clear the proposed locations for utilities, and obtain digging permits. Once the locations are approved (for both UXO and utility avoidance) for intrusive sampling, the stakes will be labeled as cleared.

4.2 Environmental Sampling

The environmental sampling program at the Former Mock Village at Yahoo Lake, Parcel 130Q-X site includes the collection of surface soil, subsurface soil, groundwater, surface water, and sediment samples for chemical analyses. These samples will be collected and analyzed to provide data for characterizing the site to determine the environmental condition of the site and any further action to be conducted at the site. Additionally, samples will be collected from environmental media in locations that will assist in the assessment of potential ecological impacts resulting from activities at the site.

4.2.1 Surface Soil Sampling

Surface soil samples will be collected from five locations at the Former Mock Village, Parcel 130Q-X.

4.2.1.1 Sample Locations and Rationale

The surface soil sampling rationale are listed in Table 4-1. Proposed sampling locations are shown in Figure 4-1. Surface soil sample designations and required QA/QC sample requirements are summarized in Table 4-2. The final soil boring sampling locations will be determined in the field by the on-site geologist, based on actual field conditions.

4.2.1.2 Sample Collection

Surface soil samples will be collected from the upper 1 foot of soil by direct-push methodology as specified in Section 4.7.1.1 of the SAP (IT, 2000a). Collected soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Surface soil samples will be screened for information purposes only, and not to select samples for analysis. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. Sample documentation and chain-of-custody (COC) will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.2 Subsurface Soil Sampling

Subsurface soil samples will be collected from five borings installed at the Former Mock Village at Yahoo Lake, Parcel 130Q-X.

Table 4-1

Sampling Locations And Rationale
Former Mock Village at Yahoo Lake, Parcel 130Q-X
Site Investigation
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sample Location Rationale
HR-130Q-MW01	Surface soil, subsurface soil, and groundwater	Soil boring and monitoring well for surface soil, subsurface soil, and groundwater samples to be placed on the north side of Parcel 130Q-X. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
HR-130Q-MW02	Surface soil, subsurface soil, and groundwater	Soil boring and monitoring well for surface soil, subsurface soil, and groundwater samples to be placed on the east end of Parcel 130Q-X. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
HR-130Q-MW03	Surface soil, subsurface soil, and groundwater	Soil boring and monitoring well for surface soil, subsurface soil, and groundwater samples to be placed on the southern side of Parcel 130Q-X. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
HR-130Q-MW04	Surface soil, subsurface soil, and groundwater	Soil boring and monitoring well for surface soil, subsurface soil, and groundwater samples to be placed on the southern side of the east-west road through the picnic areas at Yahoo Lake. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
HR-130Q-MW05	Surface soil, subsurface soil, and groundwater	Soil boring and monitoring well for surface soil, subsurface soil, and groundwater samples to be placed on the southern side of the east-west road through the picnic areas at Yahoo Lake. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
HR-130Q-SW/SD01	Surface water, sediment	Sample location on the western side of Yahoo Lake at Parcel 130Q-X. Samples will be collected from near the mouth of the intermittent tributary where it enters Yahoo Lake. Sample data will indicate if contaminant releases have occurred from runoff in the area of Parcel 130Q-X. Sample data will also be used to assess potential impacts to aquatic biota in the stream and other ecological receptors that may utilize that stream for food and/or habitat purposes.
HR-130Q-SW/SD02	Surface water, sediment	Sample location on the southwestern side of Yahoo Lake. Samples will be collected from near the mouth of the intermittent tributary where it enters Yahoo Lake. Sample data will indicate if contaminant releases have occurred from runoff in the area of Parcel 130Q-X. Sample data will also be used to assess potential impacts to aquatic biota in the stream and other ecological receptors that may utilize that stream for food and/or habitat purposes.
HR-130Q-SW/SD03	Surface water, sediment	Sample location on the southern side of Yahoo Lake. Samples will be collected from near the mouth of the intermittent tributary where it enters Yahoo Lake. Sample data will indicate if contaminant releases have occurred from runoff in the area of Parcel 130Q-X. Sample data will also be used to assess potential impacts to aquatic biota in the stream and other ecological receptors that may utilize that stream for food and/or habitat purposes.
HR-130Q-SW/SD04	Surface water, sediment	Sample location on the eastern side of Yahoo Lake. Samples will be collected from near the mouth of the intermittent tributary where it enters Yahoo Lake. Sample data will indicate if contaminant releases have occurred from runoff in the area of Parcel 130Q-X. Sample data will also be used to assess potential impacts to aquatic biota in the stream and other ecological receptors that may utilize that stream for food and/or habitat purposes.
HR-130Q-SW/SD05	Surface water, sediment	Sample location on the lake discharge on the northwestern side of Yahoo Lake. Samples will be collected from downstream of the outfall where Yahoo Lake discharges into Remount Creek. Sample data will indicate if contaminant releases have occurred from outfall of Yahoo Lake in the area of Parcel 130Q-X. Sample data will also be used to assess potential impacts to aquatic biota in the stream and other ecological receptors that may utilize that stream for food and/or habitat purposes.
HR-130Q-SW/SD06	Surface water, sediment	Sample location is in Yahoo Lake at the east end of the lake near the center of Parcel 130Q-X. Sample data will indicate if contaminants reside in the lake as a result of activities conducted at the mock village. Sample data will also be used to assess potential impacts to aquatic biota in the lake and other ecological receptors that may utilize the lake for food and/or habitat purposes.

Table 4-2

Surface Soil and Subsurface Soil Sample Designations and QA/QC Sample Quantities
Former Mock Village at Yahoo Lake, Parcel 130Q-X
Site Investigation
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
HR-130Q-MW01	HR-130Q-MW01-SS-YP0001-REG	0-1			HR-130Q-MW03-SS-YP0001-MS/MSD	TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives
	HR-130Q-MW01-DS-YP0002-REG	a				
HR-130Q-MW02	HR-130Q-MW02-SS-YP0003-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives
	HR-130Q-MW02-DS-YP0004-REG	a				
HR-130Q-MW03	HR-130Q-MW03-SS-YP0005-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives
	HR-130Q-MW03-DS-YP0006-REG	a	HR-130Q-MW03-DS-YP0007-FD	HR-130Q-MW03-DS-YP0008-FS		
HR-130Q-MW04	HR-130Q-MW04-SS-YP0009-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives
	HR-130Q-MW04-DS-YP0010-REG	a				
HR-130Q-MW05	HR-130Q-MW05-SS-YP0011-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives
	HR-130Q-MW05-DS-YP0012-REG	a				

[a] Actual sample depth selected for analysis will be at the discretion of the site geologist and will be based on field observation.

FD - Field duplicate.
FS - Field split.
MS/MSD - Matrix spike/matrix spike duplicate.
QA/QC - Quality assurance/quality control.
REG - Field sample.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
VOC - Volatile organic compound.

DWG. NO.: ...\796887es.050 | PROJ. NO.: 796887
INITIATOR: J. RAGSDALE | PROJ. MGR.: J. YACOUB
DRAFT. CHCK. BY: | ENGR. CHCK. BY: J. RAGSDALE
DATE LAST REV.: | DRAWN BY:
STARTING DATE: 02/24/00 | DRAWN BY: D. BILLINGSLEY
09/20/00 02:30:19
DBILLING
c:\cadd\design\796887es.050

E 665,700
E 666,700
E 667,700
N 1,159,700
N 1,159,100
N 1,158,500
N

REMOUNT CREEK
FLOW DIRECTION
950
975
1000
1025
1050
1075
1100
1125
1150
1175
1200

HR-130Q-SW/SD05

PARCEL 130Q-X
5.2 ACRES

YAHOO LAKE

HR-130Q-MW01
HR-130Q-SW/SD06
HR-130Q-MW02
HR-130Q-MW03
HR-130Q-SW/SD04
HR-130Q-MW05
HR-130Q-MW04
6333
6337
6334
6336
WATER WELL HOUSE
HR-130Q-SW/SD01
HR-130Q-SW/SD02
HR-130Q-SW/SD03
PICNIC SHELTERS
6339
6343
6344
TOILETS/SHOWERS
WOODS

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FOOT)
- TREES / TREELINE
- PARCEL BOUNDARY
- SURFACE DRAINAGE / CREEK
- UTILITY POLE
- PROPOSED SURFACE WATER/SEDIMENT SAMPLE LOCATION
- PROPOSED GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION

SCALE
0 200 400 FEET

FIGURE 4-1
PROPOSED SAMPLE LOCATIONS
FORMER MOCK VILLAGE AT
YAHOO LAKE
PARCEL 130Q-X

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

4.2.2.1 Sample Locations and Rationale

Subsurface soil samples will be collected from the soil borings proposed on Figure 4-1. The subsurface soil sampling rationale is listed in Table 4-1. Subsurface soil samples to be collected are listed in Table 4-2. The final soil boring sampling locations will be determined in the field by the on-site geologist, based on actual field observations and utility clearance results.

4.2.2.2 Sample Collection

Subsurface soil samples will be collected from soil borings at a depth greater than 1 foot below ground surface in the unsaturated zone. The soil borings will be advanced and soil samples collected using the direct-push sampling procedures specified in Section 4.7.1.1 of the SAP (IT, 2000a).

Soil samples will be collected continuously for the first 12 feet or until either groundwater or refusal is reached. A detailed lithogical log will be recorded by the on-site geologist for each borehole. At least one subsurface sample from each borehole will be selected for analyses. The collected subsurface soil samples will be field-screened using a PID in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings exceeding background (readings in ambient air). Typically, the subsurface soil sample showing the highest reading (above background) will be selected and sent to the laboratory for analysis. If none of the samples indicate readings exceeding background using the PID, the deepest interval from the soil boring will be sampled and submitted to the laboratory for analyses. Subsurface soil samples will be selected for analyses from any depth interval if the on-site geologist suspects PSSCs at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analyses. More than one subsurface soil sample will be collected if field measurements and observations indicate a possible layer of PSSCs and/or additional sample data would provide insight to the existence of any PSSCs.

Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.3 Permanent Residuum Monitoring Wells

Five permanent residuum monitoring wells will be installed at the Former Mock Village, Parcel 130Q-X site. The permanent residuum monitoring well locations are shown on Figure 4-1. The

rationale for the monitoring well locations are presented in Table 4-1. The monitoring well boreholes will be drilled to the top of bedrock, or until adequate groundwater is encountered to install a well with a 10 to 20 foot screen. Monitoring wells will be installed using a truck-mounted hollow-stem auger drill rig. The monitoring well casing will consist of new 2-inch inside-diameter, Schedule 40, threaded, flush-joint, polyvinyl chloride pipe. Attached to the bottom of the well casing will be a section of new threaded, flush-joint, 0.010-inch continuous wrap polyvinyl chloride well screen, approximately 10 to 20 feet long. The well will be installed so the well screen straddles the water table.

Soil samples for lithology will be collected continuously every 5 feet to the total depth of the hole during hollow-stem auger drilling to provide a detailed lithologic log. The samples will be collected for lithology using a 24-inch-long, 2-inch-or-larger-diameter, split-spoon sampler. The soil borings will be logged in accordance with American Standard for Testing and Materials Method D 2488 using the Unified Soil Classification System. The soil samples will be screened in the field using a PID. The monitoring wells will be drilled, installed, and developed as specified in Section 4.8 and Appendix C of the SAP (IT, 2000a). The exact monitoring well locations will be determined in the field by the on-site geologist, based on actual field conditions.

4.2.4 Groundwater Sampling

Groundwater samples will be collected from the five monitoring wells completed at the Former Mock Village, Parcel 130Q-X, as presented in Section 4.2.3.

4.2.4.1 Sample Locations and Rationale

Groundwater samples will be collected from the monitoring well locations shown on Figure 4-1. The groundwater sampling rationale is listed in Table 4-1. The groundwater sample designations, depths, and required QA/QC sample quantities are listed in Table 4-3.

4.2.4.2 Sample Collection

Prior to sampling monitoring wells, static water levels will be measured from each of the three monitoring wells installed at the site to define the groundwater flow in the residuum aquifer. Water level measurements will be performed as outlined in Section 4.18 of the SAP (IT, 2000a). Groundwater samples will be collected in accordance with the procedures outlined in Section 4.9.1.4 of the SAP.

Table 4-3

Groundwater Sample Designations and QA/QC Sample Quantities
Former Mock Village at Yahoo Lake, Parcel 130Q-X
Site Investigation
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
HR-130Q-MW01	HR-130Q-MW01-GW-YP3001-REG	Groundwater	a			HR-130Q-MW01-GW-YP3001-MS/MSD	TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives
HR-130Q-MW02	HR-130Q-MW02-GW-YP3002-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives
HR-130Q-MW03	HR-130Q-MW03-GW-YP3003-REG	Groundwater	a	HR-130Q-MW03-GW-YP3004-FD	HR-130Q-MW03-GW-YP3005-FS		TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives
HR-130Q-MW04	HR-130Q-MW04-GW-YP3006-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives
HR-130Q-MW05	HR-130Q-MW05-GW-YP3007-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives

[a]Sample depth will depend on where sufficient first water is encountered to collect a water sample.

FD - Field duplicate.
FS - Field split.
MS/MSD - Matrix spike/matrix spike duplicate.
QA/QC - Quality assurance/quality control.
REG - Field sample.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
VOC - Volatile organic compound.

Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP (IT, 2000a). The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.5 Surface Water Sampling

Six surface water samples will be collected from site of the Former Mock Village at Yahoo Lake, Parcel 130Q-X. Surface water samples will be collected from the four drainage ditches/creeks that enter Yahoo Lake on the eastern and southern shores as shown on Figure 4-1. The fifth surface water sample will be collected on the western side of the lake, where Yahoo Lake discharges into Remount Creek as shown on Figure 4-1.

4.2.5.1 Sample Locations and Rationale

The surface water sampling rationale are listed in Table 4-1. The surface water samples will be collected from the proposed locations on Figure 4-1. The surface water sample designations and required QA/QC sample requirements are listed in Table 4-4. The exact sampling locations will be determined in the field by the ecological sampler, based on drainage pathways and actual field observations.

4.2.5.2 Sample Collection

The surface water samples will be collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP (IT, 2000a). Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.6 Sediment Sampling

Six sediment samples will be collected from the site of the Former Mock Village at Yahoo Lake, Parcel 130Q-X. These sediment samples will be collected at the same locations as the surface water samples described in Section 4.2.6.

4.2.6.1 Sample Locations and Rationale

The proposed locations for the sediment samples are shown in Figure 4-1. Sediment sampling rationale is presented in Table 4-1. The sediment sample designation and required QA/QC sample requirements are listed in Table 4-4. The actual sediment sample points will be at the

Table 4-4

Surface Water and Sediment Sample Designations and QA/QC Sample Quantities
Former Mock Village at Yahoo Lake, Parcel 130Q-X
Site Investigation
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
HR-130Q-SW/SD01	HR-130Q-SW/SD01-SW-YP2001-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs,
HR-130Q-SW/SD01	HR-130Q-SW/SD01-SD-YP1001-REG	Sediment	0-0.5				TAL Metals, Nitroexplosives (TOC, Grain Size for sediment only)
HR-130Q-SW/SD02	HR-130Q-SW/SD02-SW-YP2002-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs,
HR-130Q-SW/SD02	HR-130Q-SW/SD02-SD-YP1002-REG	Sediment	0-0.5				TAL Metals, Nitroexplosives (TOC, Grain Size for sediment only)
HR-130Q-SW/SD03	HR-130Q-SW/SD03-SW-YP2003-REG	Surface Water	N/A	HR-130Q-SW/SD03-SW-YP2004-FD	HR-130Q-SW/SD03-SW-YP2005-FS	HR-130Q-SW/SD03-SW-YP2003-MS/MD	TCL VOCs, TCL SVOCs,
HR-130Q-SW/SD03	HR-130Q-SW/SD03-SD-YP1003-REG	Sediment	0-0.5	HR-130Q-SW/SD03-SD-YP1004-FD	HR-130Q-SW/SD03-SD-YP1005-FS	HR-130Q-SW/SD03-SD-YP1003-MS/MD	TAL Metals, Nitroexplosives (TOC, Grain Size for sediment only)
HR-130Q-SW/SD04	HR-130Q-SW/SD04-SW-YP2006-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs,
HR-130Q-SW/SD04	HR-130Q-SW/SD04-SD-YP1006-REG	Sediment	0-0.5				TAL Metals, Nitroexplosives (TOC, Grain Size for sediment only)
HR-130Q-SW/SD05	HR-130Q-SW/SD05-SW-YP2007-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs,
HR-130Q-SW/SD05	HR-130Q-SW/SD05-SD-YP1007-REG	Sediment	0-0.5				TAL Metals, Nitroexplosives (TOC, Grain Size for sediment only)
HR-130Q-SW/SD06	HR-130Q-SW/SD06-SW-YP2008-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs,
HR-130Q-SW/SD06	HR-130Q-SW/SD06-SD-YP1008-REG	Sediment	0-0.5				TAL Metals, Nitroexplosives (TOC, Grain Size for sediment only)

MS/MSD - Matrix spike/matrix spike duplicate.
NA - Not applicable.
QA/QC - Quality assurance/quality control.
REG - Field sample.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
TOC - Total organic carbon.
VOC - Volatile organic compound.

discretion of the ecological sampler, based on the drainage pathways and actual field observations.

4.2.6.2 Sample Collection

The sediment samples will be collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP. Sediment samples for volatile organic analysis will be collected in EnCore sampling devices. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. The sediment samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.3 Decontamination Requirements

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP (IT, 2000a). Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

4.4 Surveying of Sample Locations

Sampling locations will be marked with pin flags, stakes, and/or flagging and will be surveyed using either global positioning system (GPS) or conventional civil survey techniques, as necessary to obtain the required level of accuracy. Horizontal coordinates will be referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum, 1983. Elevations will be referenced to the National Geodetic Vertical Datum of 1929 or the North American Vertical Datum of 1988 (soon to be established on site).

Horizontal coordinates for soil, sediment, and surface water locations will be recorded using a GPS to provide accuracy within 1 meter. Because of the need to use permanent monitoring wells to determine water levels, a higher level of accuracy is required. Monitoring wells will be surveyed to an accuracy of 0.1 foot for horizontal coordinates and 0.01 foot for elevations, using survey-grade GPS techniques and/or conventional civil survey techniques, as required. Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP. All areas at this site must be cleared for UXO avoidance before any surveying activities will commence.

4.5 Analytical Program

Samples collected at locations specified in this chapter of this SFSP will be analyzed for the specific suites of chemicals and elements based on the history of site usage, as well as EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from the Former Mock Village at Yahoo Lake, Parcel 130Q-X, consist of the following list of analytical suites:

- Target Compound List Volatile Organic Compounds - Method 5035/8260B
- Target Compound List Semivolatile Organic Compounds - Method 8270C
- Target Analyte List Metals - Method 6010B/7000.
- Nitroexplosives - Method 8330.

In addition, the sediment samples will be analyzed for the following list of parameters:

- Total Organic Carbon - Method 9060
- Grain Size - ASTM D-421/D-422.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-5 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program-like forms and electronic copies. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

4.6 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping will follow the procedures specified in Section 4.13.2 of the SAP (IT, 2000a). Completed analysis request/COC records will be secured and included with each shipment of coolers to:

Attn: John Reynolds
Severn Trent Laboratories, Inc.
5815 Middlebrook Pike
Knoxville, Tennessee 37921
Telephone: (865) 588-6401.

Table 4-5

Analytical Samples
Site Investigation
Former Mock Village at Yahoo Lake, Parcel 130Q-X
Fort McClellan, Calhoun County, Alabama

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples: No. of Sample Points	Field Samples: No. of Events	Field Samples: No. of Field Samples	QA/QC Samples[a]: Field Dups (10%)	QA/QC Samples[a]: Splits w/ QA Lab (5%)	QA/QC Samples[a]: MS/MSD (5%)	QA/QC Samples[a]: Trip Blank (1/ship)	QA/QC Samples[a]: Eq. Rinse (1/wk/matrix)	Quanterra Total No. Analysis	QA Lab Total No. Analysis
Former Mock Village, Parcel 130Q-X: 11 water matrix samples (5 groundwater samples and 6 surface water samples); **12 soil matrix samples** (5 surface soil samples, 5 subsurface soil samples, and 6 sediment samples													
TCL VOCs	8260B	water	normal	11	1	11	3	3	3	2	1	23	3
TCL SVOCs	8270C	water	normal	11	1	11	3	3	3		1	21	3
Tot TAL Metals	6010B/7000	water	normal	11	1	11	3	3	3		1	21	3
Nitroexplosives	8330	water	normal	11	1	11	3	3	3		1	21	3
TCL VOCs	8260B	soil	normal	16	1	16	3	3	3		1	26	3
TCL SVOCs	8270C	soil	normal	16	1	16	3	3	3		1	26	3
TAL Metals	6010B/7000	soil	normal	16	1	16	3	3	3		1	26	3
Nitroexplosives	8330	soil	normal	16	1	16	3	3	3		1	15	1
TOC	9060	sediment	normal	6	1	6						6	0
Grain Size	ASTM D-421/D-422	sediment	normal	6	1	6						6	0
Former Mock Village at Yahoo Lake, Parcel 130Q-X Subtotal:						120	24	24	24	2	8	191	22

[a]Field duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded to the nearest whole number.
Trip blank samples will be collected in association with water matrix samples for VOC analysis only. Assumed four field samples per day to estimate trip blanks. Equipment blanks will be collected once per event whenever sampling equipment is field decontaminated and re-used. They will be repeated weekly for sampling events that are anticipated to last more than 1 week. Assumed 20 field samples will be collected per week to estimate number of equipment blanks.

Ship samples to:
Severn Trent Laboratories, Inc.
5815 Middlebrook Pike
Knoxville, Tennessee 37921
Attn: John Reynolds
Tel: 865-588-6401
Fax: 865-584-4315

USACE Laboratory split samples are shipped to:
U.S. Army Engineer District, Savannah
Environmental & Materials District
Attn: Sample Receiving
200 North Cobb Parkway
Building 400, Suite 404
Marietta, Georgia 30062
Tel: 678-354-0310

MS/MSD - Matrix spike/matrix spike duplicate.
QA/QC - Quality assurance/quality control.
SVOC - Semivolatile organic compound.
VOC - Volatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
TOC - Total organic carbon.
ASTM- American Society for Testing and Materials

QA split samples collected for the USACE laboratory will be shipped to the following address:

U.S. Army Engineer District, Savannah
Environmental & Materials Unit
Attn: Sample Receiving
200 North Cobb Parkway
Building 400, Suite 404
Marietta, Georgia 30062
Telephone: (678) 354-0310.

4.7 Investigation-Derived Waste Management

Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements as described in Appendix D of the SAP (IT, 2000a). The IDW generated at the Former Mock Village at Yahoo Lake, Parcel 130Q-X site is expected to include decontamination fluids and disposable personal protective equipment. The IDW will be staged in the fenced area surrounding Buildings 335 and 336 while awaiting final disposal.

4.8 Site-Specific Safety and Health

Health and safety requirements for this SI are provided in the SSHP attachment for the Former Mock Village at Yahoo Lake, Parcel 130Q-X. The SSHP attachment will be used in conjunction with the installation-wide SHP.

5.0 Project Schedule

The project schedule for the SI activities will be provided by the IT Project Manager to the Base Realignment and Closure Cleanup Team and will be in accordance with the WP.

6.0 References

Environmental Science and Engineering, Inc. (ESE), 1998, ***Final Environmental Baseline Survey, Fort McClellan, Alabama***, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

Fort McClellan (FTMC), 1997, ***Fort McClellan Comprehensive Reuse Plan***, Fort McClellan Reuse and Redevelopment Authority of Alabama, prepared under contract to the Calhoun County Commission, November.

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U.S. Army Corps of Engineers (USACE), 1999b, ***Statement of Work for Task Order CK10, Remedial Investigations (RIs) at the Chemical Warfare Material Sites, RIs at the Fuel/Training Areas, RIs at the Print Plants/Motor Pools, RIs at the Ground Scars/Boiler Plants, RI at Range 24A, Site Investigations (SIs) at the Historic Ranges, and a Groundwater Investigation at Rideout Field at Fort McClellan, Alabama,*** June.

U.S. Army Corps of Engineers (USACE), 1994, ***Requirements for the Preparation of Sampling and Analysis Plan***, Engineer Manual EM 200-1-3, September 1.

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ATTACHMENT 1

LIST OF ABBREVIATIONS AND ACRONYMS

List of Abbreviations and Acronyms

Abs	skin absorption
AC	hydrogen cyanide
AcB2	Anniston and Allen gravelly loams, 2 to 6 percent slopes, eroded
AcC2	Anniston and Allen gravelly loams, 6 to 10 percent slopes, eroded
AcD2	Anniston and Allen gravelly loams, 10 to 15 percent slopes, eroded
AcE2	Anniston and Allen gravelly loams, 15 to 25 percent slopes, eroded
ACGIH	American Conference of Governmental Industrial Hygienists
ADEM	Alabama Department of Environmental Management
AEL	airborne exposure limit
AL	Alabama
amb.	Amber
ANAD	Anniston Army Depot
APT	armor piercing tracer
ASP	Ammunition Supply Point
ASR	Archives Search Report, July 1999
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
B	analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero)
BCT	BRAC Cleanup Team
BFB	bromofluorobenzene
bgs	below ground surface
bkg	background
bls	below land surface
BOD	biological oxygen demand
BRAC	Base Realignment and Closure
Braun	Braun Intertec Corporation
BTEX	benzene, toluene, ethylbenzene, and xylenes
BTOC	below top of casing
BZ	breathing zone
C	ceiling limit value
Ca	carcinogen
CCAL	continuing calibration
CCB	continuing calibration blank
CD	compact disc
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CFC	chlorofluorocarbon
CG	cyanogen chloride
ch	inorganic clays of high plasticity
CK	carbonyl chloride
cl	inorganic clays of low to medium plasticity
Cl.	chlorinated
CLP	Contract Laboratory Program
CN	chloroacetophenone
CNB	chloroacetophenone, benzene, and carbon tetrachloride
CNS	chloroacetophenone, chloropicrin, and chloroform
COC	chain of custody
COE	Corps of Engineers
Con	skin or eye contact
CRL	certified reporting limit
CRZ	contamination reduction zone
CS	ortho-chlorobenzylidene-malononitrile
CSEM	conceptual site exposure model
ctr.	container
CWA	chemical warfare agent
CWM	chemical warfare materials, clear wide mouth
CX	dichloroformoxime
D	duplicate
DANC	decontamination agent, non-corrosive
ºC	degrees Celsius
ºF	degrees Fahrenheit
DDT	dichlorodiphenyltrichloroethane
DEP	depositional soil
DI	deionized
DIMP	di-isopropylmethylphosphonate
DMMP	dimethylmethylphosphonate
DOD	U.S. Department of Defense
DP	direct-push
DPDO	Defense Property Disposal Office
DQO	data quality objective
DRMO	Defense Reutilization and Marketing Office
DS	deep (subsurface) soil
DS2	Decontamination Solution Number 2
E&E	Ecology and Environment, Inc.
EBS	environmental baseline survey
Elev.	elevation
EM	electromagnetic
EM31	Geonics Limited EM31 Terrain Conductivity Meter
EM61	Geonics Limited EM61 High-Resolution Metal Detector
EOD	explosive and ordnance disposal
EODT	explosive and ordnance disposal team
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
EPIC	Environmental Photographic Interpretation Center
ER	equipment rinsate
ESE	Environmental Science and Engineering, Inc.
ESV	ecological screening value
E-W	east to west
EZ	exclusion zone
FB	field blank
FD	field duplicate
FedEx	Federal Express, Inc.
FFE	field flame expedient
Fil	filtered
Flt	filtered
FMP 1300	Former Motor Pool 1300 Site
Frtn	fraction
FS	field split
ft	feet
ft/ft	feet per foot
FTA	fire training area
FTMC	Fort McClellan
g	gram
G-856	Geometrics, Inc. G-856 magnetometer
G-858G	Geometrics, Inc. G-858G magnetic gradiometer
gal	gallon
gal/min	gallons per minute
GB	sarin
gc	clay gravels; gravel-sand-clay mixtures
GC	gas chromatograph
GC/MS	gas chromatograph/mass spectrometer
GFAA	graphite furnace atomic absorption
gm	silty gravels; gravel-sand-silt mixtures
gp	poorly graded gravels; gravel-sand mixtures
gpm	gallons per minute
GPR	ground-penetrating radar
GPS	global positioning system
GSBP	Ground Scar Boiler Plant
GSSI	Geophysical Survey Systems, Inc.
GW	groundwater
gw	well-graded gravels; gravel-sand mixtures
HA	hand auger
HCl	hydrochloric acid
HD	distilled mustard
HDPE	high-density polyethylene
Herb.	herbicides
HNO_3	nitric acid
hr	hour
H&S	health and safety
HSA	hollow stem auger
HTRW	hazardous, toxic, and radioactive waste
I	out of control, data rejected due to low recovery
ICAL	initial calibration
ICB	initial calibration blank
ICP	inductively-coupled plasma
ICS	interference check sample
ID	inside diameter
IDL	instrument detection limit
IDLH	immediately dangerous to life or health
IDW	investigation-derived waste
IMPA	isopropylmethyl phosphonic acid
in.	inch
Ing	ingestion

List of Abbreviations and Acronyms (Continued)

Inh	inhalation
IP	ionization potential
IPS	International Pipe Standard
IRDMIS	Installation Restoration Data Management Information System
IT	IT Corporation
ITEMS	IT Environmental Management System ™
J	estimated concentration
JeB2	Jefferson gravelly fine sandy loam, 2 to 6 percent slopes, eroded
JeC2	Jefferson gravelly fine sandy loam, 6 to 10 percent slopes, eroded
JfB	Jefferson stony fine sandy loam, 0 to 10 percent slopes have strong slopes
K	conductivity
L	lewisite; liter
LC_{50}	lethal concentration for 50 percent of population tested
LD_{50}	lethal dose for 50 percent of population tested
l	liter
LCS	laboratory control sample
LEL	lower explosive limit
LT	less than the certified reporting limit
max	maximum
MDL	method detection limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mg/m^3	milligrams per cubic meter
mh	inorganic silts, micaceous or diatomaceous fine, sandy or silt soils
MHz	megahertz
µg/g	micrograms per gram
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µmhos/cm	micromhos per centimer
min	minimum
MINICAMS	miniature continuous air sampling system
ml	inorganic silts and very fine sands
mL	milliliter
mm	millimeter
MOGAS	motor vehicle gasoline
MPA	methyl phosphonic acid
MR	molasses residue
MS	matrix spike
mS/cm	milliSiemens per centimeter
MSD	matrix spike duplicate
msl	mean sea level
MtD3	Montevallo shaly, silty clay loam, 10 to 40 percent slopes , severely eroded
mV	millivolts
MW	monitoring well
N/A	not applicable; not available
NAD	North American Datum
NAD83	North American Datum of 1983
NAVD88	North American Vertical Datum of 1988
ND	not detected
NE	no evidence
NFA	No Further Action
ng/L	nanograms per liter
NGVD	National Geodetic Vertical Datum
NIC	notice of intended change
NIOSH	National Institute for Occupational Safety and Health
No.	number
NOAA	National Oceanic and Atmospheric Administration
NR	not requested
ns	nanosecond
N-S	north to south
nT	nanotesla
NTU	nephelometric turbidity unit
O&G	oil and grease
OD	outside diameter
OE	ordnance and explosives
oh	organic clays of medium to high plasticity
ol	organic silts and organic silty clays of low plasticity
OP	organophosphorus
OSHA	Occupational Safety and Health Administration
OWS	oil/water separator
oz	ounce
PAH	polynuclear aromatic hydrocarbon
Pb	lead
PCB	polychlorinated biphenyl
PCE	perchlorethene
PDS	Personnel Decontamination Station
PEL	permissible exposure limit
Pest.	pesticide
PG	professional geologist
PID	photoionization detector
PkA	Philo and Stendal soils local alluvium, 0 to 2 percent slopes
POL	petroleum, oils, and lubricants
PP	peristaltic pump
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PPMP	Print Plant Motor Pool
ppt	parts per thousand
PSSC	potential site-specific chemical
pt	peat or other highly organic silts
PVC	polyvinyl chloride
QA	quality assurance
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
QC	quality control
QST	QST Environmental Inc.
qty	quantity
Qual	qualifier
R	rejected
RCRA	Resource Conservation and Recovery Act
ReB3	Rarden silty clay loams
REG	field sample
REL	recommended exposure limit
RFA	request for analysis
RI	remedial investigation
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
RSD	relative standard deviation
RTK	real-time kinematic
SAD	South Atlantic Division
SAE	Society of Automotive Engineers
SAIC	Science Applications International Corporation
SAP	installation-wide sampling and analysis plan
sc	clayey sands; sand-clay mixtures
Sch.	schedule
SD	sediment
SDG	sample delivery group
SDZ	safe distance zone
SEMS	Southern Environmental Management & Specialties
SFSP	site-specific field sampling plan
SGF	standard grade fuels
SHP	installation-wide safety and health plan
SI	site investigation
sm	silty sands; sand-silt mixtures
SOP	standard operating procedure
sp	poorly graded sands; gravelly sands
SP	sump pump
Ss	stony rough land, sandstone series
SS	surface soil
SSC	site-specific chemical
SSHO	site safety and health officer
SSHP	site-specific safety and health plan
SSSL	site-specific screening level
STB	supertropical bleach
STEL	short-term exposure limit
STOLS	Surface Towed Ordnance Locator System®
Std. units	standard units
SU	standard unit
SVOC	semivolatile organic compound
SW	surface water
SW-846	U.S. EPA *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*
SZ	support zone
TAL	target analyte list

TAT	turn around time
TB	trip blank
TCE	trichloroethene
TCL	target compound list
TCLP	toxicity characteristic leaching procedure
TDGCL	thiodiglycol
TDGCLA	thiodiglycol chloroacetic acid
TERC	Total Environmental Restoration Contract
TIC	tentatively identified compounds
TLV	threshold limit value
TN	Tennessee
TOC	top of casing, total organic carbon
TPH	total petroleum hydrocarbons
TRADOC	U.S. Army Training and Doctrine Command
TRPH	total recoverable petroleum hydrocarbons
TWA	time weighted average
UCL	upper confidence limit
UCR	upper certified range
UJ	not detected above reporting limit; result should be estimated
USACE	U.S. Army Corps of Engineers
USAEC	U.S. Army Environmental Center
USAEHA	U.S. Army Environmental Hygiene Agency
USAMCLS	U.S. Army Chemical School
USATEU	U.S. Army Technical Escort Unit
USATHAMA	U.S. Army Toxic and Hazardous Material Agency
USCS	Unified Soil Classification System
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
UXO	unexploded ordnance
VOA	volatile organic analyte
VOC	volatile organic compound
VOH	volatile organic hydrocarbon
VQlfr	validation qualifier
VQual	validated qualifier
VX	nerve agent (O-ethyl-S- [diisoproplaminoethyl]-methylphosphonothiolate)
Weston	Roy F. Weston, Inc.
WP	installation-wide work plan
WS	watershed
WSA	Watershed Screening Assessment
WWI	World War I
WWII	World War II
XRF	x-ray fluorescence
yd^3	cubic yards